

# IS GIARDIA REALLY *a* PROBLEM?

STORY AND PHOTOGRAPHY BY PETER STEKEL

Worried about giardiasis, the Forest Service and National Park Service encourage Sierra hikers to either filter or treat their water because it could be unsafe to drink. Giardiasis is caused by the intestinal parasite, *Giardia lamblia*. According to the National Institutes for Health (NIH), it's transmitted through contact with infected feces, either directly (such as between children) or indirectly, through food and water contaminated with cyst-containing feces (see sidebar). Children, especially diapered children and toddlers being toilet-trained, and families with young children who attend day-care centers shoulder the greatest risk of developing giardiasis.

Danny Boiano, aquatic ecologist for Sequoia and Kings Canyon National Parks says, "There's no evidence that the water in the parks is unsafe." The NPS recom-

mends treating or filtering water as a precaution, especially for inexperienced hikers and campers. Recent studies indicate that giardia incidence is extremely low in the wilderness of Yosemite, Sequoia and Kings Canyon. But Boiano cautions, "We can't say definitively that there's no giardia anywhere because the whole Sierra hasn't been sampled."

Giardiasis isn't a nationally notifiable disease. Still, the Centers for Disease Control (CDC) reported that between 1979-1988, giardia caused an estimated 4,600 hospitalizations per year throughout the entire United States. The CDC also reported giardia frequency increased between 1992-1997 with 43 states now reporting the parasite. New York, with 3,673 cases in 1997, had the highest incidence.

Some 7% of Americans are suspected to

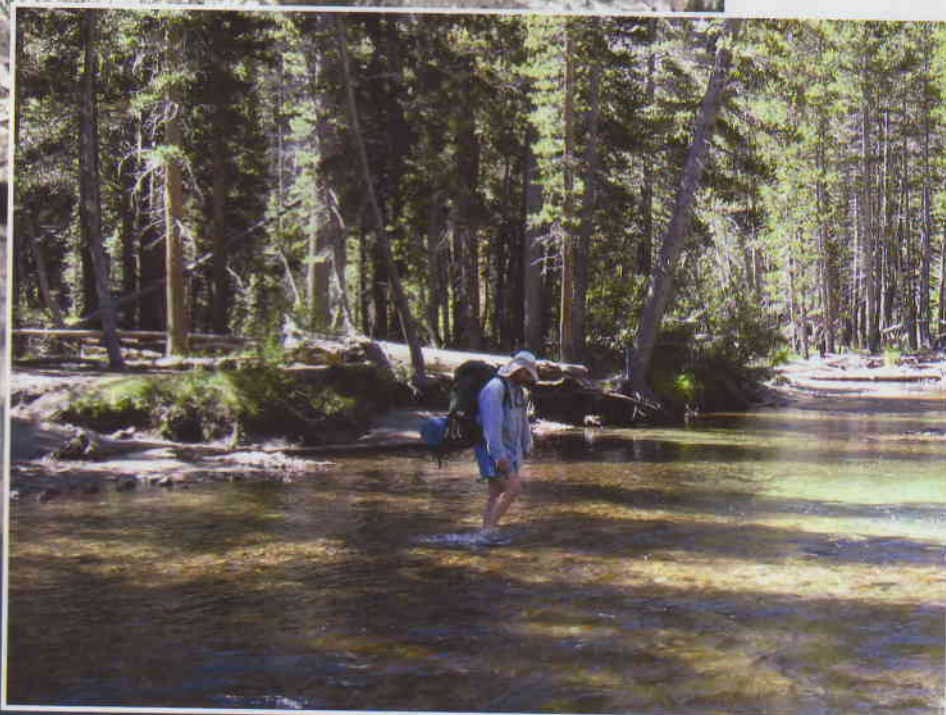
be carrying giardia with children being the most likely to be infected. "The seasonal peak in age-specific case reports coincides with the summer recreational water season and might reflect the heavy use by young children of communal swimming venues," the CDC report stated.

For Sierra hikers, the most interesting part of the CDC report is that during the study period absolutely no cases of giardiasis were reported from California.

There are several factors working against establishing viable populations of giardia in the High Sierra. Trophozoites can't survive outside of the host. Giardia cysts cannot remain viable more than 2-3 months in freezing temperatures. Cysts encased in snow or frozen lakes probably don't last the winter. Cysts that might remain encased in feces on, or under the



**Although the Forest Service and National Park Service say there is no evidence of unsafe water, they recommend filtering or treating water as a precaution (inset, this page) Author, Peter Stekel, a Sierra hiker since 1965, still carries water treatment and a filter, but has also learned to "Drink Smart".**



soil surface, will probably not survive the winter's sub-freezing temperatures either.

Though giardia is known to infect domestic and wild animals (cats, dogs, cattle, deer, bear, rodents and beavers) no evidence exists for its spread in the backcountry by packstock. During the summer of 2003, Bob Derlet, MD, professor of medicine from the University of California at Davis, hiked 186 miles between Yosemite and Sequoia National Park collecting samples of "road apples" to address the potential health risks to people drinking from Sierra streams.

Dr. Derlet found encouraging news for both packers and backcountry hikers. "Pack animal manure commonly encountered by backpackers on Sierra Nevada trails contains large numbers of commensal enteric bacteria normally found in ani-

mals. Human pathogens with potential medical importance are present but have a low prevalence," Derlet says. Bacterial pathogens were found in two specimens (of 23) collected from wild animals while giardia was identified in one pack animal sample near Tuolumne Meadows.

Derlet believes the seriousness of being exposed to giardia in national park wilderness has been over emphasized. "The average concentration of less than ten cysts per 1000 liters reported in studies of Sierra Nevada wilderness water poses minimal risk to humans." That's a frequency lower than what is allowable in San Francisco and Los Angeles, both of which import vast amounts of Sierra water for municipal use.

"Low pathogen numbers tells me that the park service is doing a wonderful job of preserving the backcountry, especially

compared to what could be done without any restriction and monitoring," Derlet says. "In many wilderness areas of California where there are cattle and sheep grazing," pathogenic forms of e.coli are common.

But how to explain the known incidence of diarrhea in Sierra hikers?

If it's from giardia, the affected person has a greater chance of having picked it up from another member of their party. Remember, it's commonly spread by direct fecal-oral or food-borne transmission. The same could be said for bacterial contamination. Poor personal hygiene is a more likely cause for most hiker diarrhea.

Avoiding giardia or pathogenic bacteria from possibly contaminated water is easy, but problematic. Water treatments relying on iodine or chlorine have been found by the CDC to be less effective than filters because they're highly dependent on water temperature, pH and cloudiness. Water filters may remove giardia but not all pathogens. Easily clogged with sediments, filters aren't suited for extended trips.

If concerned with water quality the best advice appears to be learning how to "Drink Smart." Get water from large fast-flowing streams or at lake inlets. Since giardia cysts don't survive Sierra winters, any contamination begins fresh every year. Spring runoff therefore is safer than summer or fall. And so is water at higher elevations where reduced human and animal presence means less opportunity for contamination. Finally, avoid water passing through heavily human or animal impacted areas. Boiling water for several minutes is an inconvenient option, using lots of fuel which has to be carried. The best away to avoid getting sick while hiking is to do what your mother always told you: "Wash your hands." **SH**